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EXAMINER	
MOORE, IAN N	

ART UNIT	PAPER NUMBER
2661	

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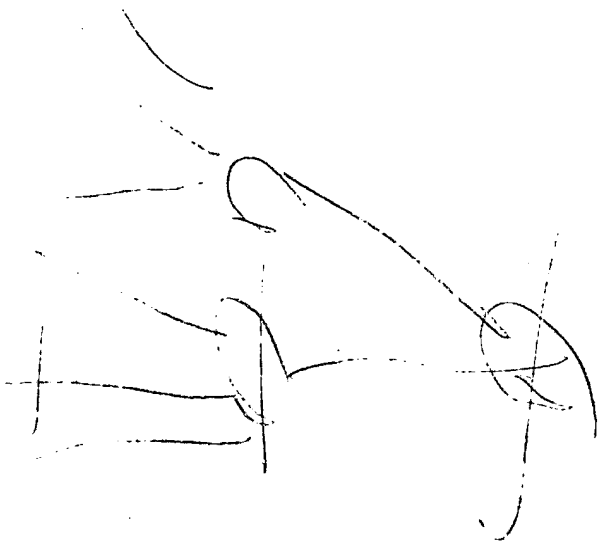
Please find below and/or attached an Office communication concerning this application or proceeding.



Office Action Summary	Application No.	Applicant(s)	
	09/519,282	LENOSKI ET AL.	
	Examiner	Art Unit	
	Ian N Moore	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) 1,5-10 and 13-25 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,5-10 and 13-25 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 1-6-2004 have been fully considered but they are not persuasive.

Regarding claims 13-18, the applicant alleged, "...there is no teaching or motivation within Teraslinna'990 and/or Limb to combine these references..."

The examiner respectfully disagrees that that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation is suggested by Iino'115 in col. 2, line 36-54; note that Iino'115s teaches how to overcome a problem of not having a spare switch (i.e. in the absence of the spare switch) in the network by utilizing the routing control tables in order to by pass the malfunction switch. In addition, Teraslinna'990 teaches N+K switch network, where there are N working switches and K standby switches. Teraslinna'990 system does not disclose how to handle the packet switching when K equal to zero, that is, all standby switches are being used and there are no more available standby switches, and the failure/malfunction occurs in the network. Iino'115 teaches how to handle such scenario by utilizing the routing table in order to bypass failure/malfunction in the absence of the spare/standby switch or when there is no available spare/standby switch. Thus, Iino'115

teaches how to overcome the de-efficiencies of Teraslinna'990, rather than teaching away from it.

Moreover, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, both Teraslinna'990 and Iino'115 are concerned with an apparatus and method how to overcome the failure in the packet switching network.

Further, it is noted that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Thus, the packet switching system of Teraslinna'990 can be combined/modified with the packet switching system of Iino'115 utilizing the routing control tables in order to by pass the malfunction switch in the absent of the standby/spare switch.

The applicant alleged, in claim 13, that "...Terashnna only discloses a single interconnection network..."

In response applicant's argument, the applicant broadly claimed "...a packet switching system..." and "...a plurality of interconnection networks..." Teraslinna'990 discloses the broad limitation of the claim "a plurality of interconnection networks" in the "packet switching system". In particular, Examiner asserts that a network is formed when

two or more components are coupled. Examiner asserts a first network as Stage 1 (which comprises the nodes 340, 341,348,349; see Teraslinna'990 FIG. 1) and a second network as Stage 2 (which comprises the nodes 350,351,358, and 359; see Teraslinna'990 FIG. 1). Further, Examiner assets a first interconnection networks as a network between node 340 (at Stage 1) to node 350 (at Stage 2), and second interconnection networks as a network between node 341 (at Stage 1) to node 351 (at Stage 2). See Teraslinna'990, FIG. 1.

The applicant alleged, in claim 13, that "...Ino is directed at changing a route of a transmission path formed in the single interconnection network 1, and not selecting between a plurality of interconnection networks..."

In response applicant's argument, the applicant broadly claimed "...a packet switching system..." and "...a plurality of interconnection networks..." The claim does not recite how each component, each network, and/or each interconnection network are connected in any specific order/manner. Iino'115 discloses the broad limitation of the claim "a plurality of interconnection networks" in the "packet switching system". In particular, Examiner asserts that a network is formed when two or components are coupled. Examiner asserts a first network as Stage a (which comprises the switches 00,01,10,11 at 1st column; see Iino'115 FIG. 17A), and a second network as Stage b (which comprises the switches 00101,10,11 at 2nd column; see Iino'115 FIG. 17A). Further, Examiner assets 1st interconnection networks as a network between switch 00 (at Stage a) to switch 00 (at Stage b), 2nd interconnection networks as a network between switch 01 (at Stage a) to switch 01 (at Stage b), 3rd interconnection network as a network between switch 10 (at Stage a) to switch 10 (at Stage b), and 4th interconnection networks as a network between switch 11 (at Stage a)

to switch 11 (at Stage b). Also, per Iino'115 FIG. 17A, the failure occurs at switch 01 (at Stage b) in interconnection networks, and the routing selection is performed among the switches in the plurality of interconnection networks (i.e. among switches in Stage b). Then after, switch 11 (at Stage b) is selected in order to bypass the failure, that is, selecting 4th interconnection networks between a plurality of 1st, 3rd, and 4th interconnection networks. See Iino'115 FIG. 17B; and col. 5, lines 60 to col. 11, lines 26. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The applicant alleged, in claims 14-18, that "...Ino ... fails to explain what broadcasting functionality is possessed by Input Switching Unit 3..." and "...the Office action equates Input Switching Unit 3 as **the broadcast component**, and Ino clearly in FIG. 4 teaches that Input Switching Unit 3 is not located in an interconnection network 1..."

In response applicant's argument, examiner asserts the "broadcast mechanism" as Teraslinna'990's "notifying the plurality components of the problem". Thus, Teraslinna'990 teaches broadcast mechanism. Iino'115 further discloses Input Switching unit receiving message/instruction/packet with an indication of the problem. Note that failure detection messages, error indication message, or instruction is received/transmitted in order notify/acknowledge the indication of the failure; thus, the failure message/packet/instruction must be publicized/transmitted/broadcasted. Therefore, Iino'115 also discloses broadcast mechanism. Therefore, the combined system of Teraslinna'990 and Iino'115 teaches a complete broadcast mechanism of receiving an indication of the problem within the packet switch and to notify/broadcast the components of the problem. Claims 13-18 do not recites

"...a broadcast component..." **instead the claims broadly recite as "...a broadcast mechanism**..." Again, Teraslinna'990 discloses transmitting/notifying a plurality of components, and the notification is performed within one of the plurality of interconnection networks (see FIG. 1 and FIG. 8; see col. 5, line 68 to col. 8, lines 17), and Iino'115 discloses receiving a broadcast/notification message with an indication of the problem. Thus, the combined system of Teraslinna'990 and Iino'115 teaches the completed broadcast mechanism is located in one of the plurality of interconnection network.

Moreover, it is noted that the test for combining reference is what the combination of discloses taken as a whole would suggest to one ordinary skill in the art, thus, one cannot show non-obvious by arguing reference individually where, as here, the rejections are based on combination of references. Therefore, when considering the combination of Teraslinna'990 and Iino'115 as whole at the time of the invention made, one skilled in the art would have been motivated to provide a mechanism by utilizing the routing control tables in order to bypass the malfunction switch in the absent of the standby/spare switch in order to modify the system of Teraslinna'990 as taught by Iino'115, since Iino'115 suggested at col. 2, line 36-54 that such a modification would make the system of Teraslinna'990 to bypass the malfunction switch in the absent of the standby/spare switch and decrease the weight/size/cost of the rout processing in the system.

In view of the above, the examiner believes that the combination of references as set forth in the 103 rejections is proper, thus, Claims 13-18 are obvious over Teraslinna'990 in view of Iino'115 for at least the reasons discussed above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Amended claims 1, and new claims 21,22 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Sheu (U.S. 5,848,227).

Regarding amended Claim 1, and new Claims 21 and 25, Sheu'227 discloses an apparatus and method comprising a packet switch (see FIG. 2, Bridge/Router "Brouter" 20), the packet switch including:

a plurality of input components (see FIG. 3, LIU 42 at each PE couples to each LAN; each LIU is the Input/Output unit which couples to I/O ports; see col. 4, lines 15-40);

a plurality of output components (see FIG. 3, LIU 42 at each PE couples to each LAN; each LAN Interface Unit, LIU, is the Input/Output unit; see col. 4, lines 15-40); and

one or more interconnection networks (see FIG. 3, a plurality of switch fabric buses, BUS 30A-30C, connects to the PE units via BIU 44), each of said one or more interconnection networks coupled to each of the plurality of input components and to each of the output components (see FIG. 2, each BUS couples to LIU 42 in PE units; see col. 2, lines 59-66),

a broadcast component (see FIG. 3, a combined system of a plurality of switch fabric buses and the PE unit),

recognizing an error within the packet switch (see FIG. 4, PE2 detects failure; see col. 6, lines 14-62),

each of said one or more interconnection networks including a broadcast mechanism configured to receive control packets transported through a portion of said one or more interconnection networks (see FIG. 4, PE2 declares a failure; col. 6, lines 1-12; Broadcast/Declaration messages are received at the plurality of BUS 1-3 networks upon to detection of failure), said control packets each indicating an indication of an error condition (see FIG. 5, where %=PE failure declaration; also see col. 6, lines 14-62; note that the broadcast/declaration message with symbol % which is the failure signal/condition/message/packet), and

said broadcast mechanism configured to send a plurality of packets through at least a second portion of said one or more interconnection networks to the plurality of input components (see FIG. 4, PE2 declare failure; col. 6, lines 1-12; note that Broadcast/Declaration messages are send from the plurality of BUS 1-3 to LIU 42 in PE units).

Regarding new Claim 22, Soloway'092 discloses wherein said one or more interconnection networks includes at least two interconnection networks (see FIG. 3, three switch fabric buses, BUS 30A-30C, connects to PE units via BIU 44).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sheu'227 in view of Soloway (U.S. 5,265,092).

Regarding Claim 6, Sheu'227 discloses the input component updating one or more status data structures in response to receiving a notification of the error (see FIG. 3, Memory 40, HPU46, and BIU 44; see col. 4, lines 24-67; col. 5, lines 50 to col. 6, lines 62; note that ACK messages/packets are send between PEs. When a failure is detected, the failure declaration message is send to the PEs. Each PE has a internal memory 40 and HPU 46, and HPU performs the table look-up and updating according to the routing. Upon detecting the failure, the PE polls to RCT table in order to update the routing information.

Sheu'227 does not explicitly disclose each component (see FIG. 1, Switches 4a-4d) updating one or more status data structures (see FIG. 2, Forwarding Table) in response to receiving a notification (see Soloway'092 col. 3, line 1-23; note that LSP packet is send to each switch in the network in order to broadcast/notify the link state. Upon receiving LSP packet, each switch updates the forwarding table accordingly).

However, this limitation is taught by Soloway'092. Note that Sheu'227 teaches receiving broadcast message/packet regarding the failure at the PEs, and the PE updates re-routing table accordingly inside the packet switch. Soloway'092 teaches receiving LSP packets at each switch in the network, and each switch update the routing accordingly. Soloway'092's packet routing/switching technique/functionality can be used to modify Sheu'227's switch. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Sheu'227, as taught by Soloway'092 for the purpose of receiving LSP packet and update the routing table at each switch accordingly, since Soloway'092 states in col. 3, lines 1-24 that it will achieve loop-free routing of data packets. The motivation being that by updating the forwarding table in each switch upon receiving an LSP packet, it can readily switchover to available/configured route/path/link, which increase the routing efficiency and reduce the routing loop.

Regarding claim 7, the combined system of Sheu'227 and Soloway'092 teaches a router/bridge/switch, which consists of plurality of processing elements, interconnected via switch fabric buses, and the router/bridge/switch utilizes the packet switching/routing techniques use in the packet switching network as described above in Claim 6. Furthermore, Sheu'227 discloses the input component determining which of a plurality of paths leading to a destination output component over which to send a particular packet, the path determined by referencing the one or more status data structures (see col. 6, line 4-67; note that upon detection the failure, PE unit acquires the entries in the RCT table in order to determine and route/forward the packets to the destination PE.)

Soloway'092 discloses each of the plurality of components determining which of a plurality of paths leading to a destination component over which to send a particular packet, the path determined by referencing the one or more status data structures (see FIG. 3, forwarding table, and FIG. 4, Forwarding Process logic 40, Forwarding Table 36, Routing Logic 38, LSP Database; col. 3, line 15-5; note that the each switch re-computes/determines each route to the destination switch/end-node according to shortest path routing algorithm. Then after, the packets are routed according to the switchover or reconfigured paths/links toward the destination).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Sheu'227 as taught by Soloway'092 by providing a mechanism to recomputed/re-calculate/determines the shortest paths/routes toward the destination in the forwarding table for the same reason stated in Claim 6 above.

Regarding claim 8, the combined system of Sheu'227 and Soloway'092 teaches a router/bridge/switch, which consists of plurality of the plurality of input and output component, interconnected via switch fabric buses, and the router/bridge/switch utilizes the packet switching/routing techniques use in the packet switching network as described above in Claim 6. Furthermore, Sheu'227 discloses wherein the input component references its one or more status data structures in determining which of a plurality of paths leading to a destination output component over which to send a particular packet (see col. 6, line 4-67; note that upon detection the failure, the PE unit acquires the entries in the RCT table in order to determine and route/forward the packets to the destination PE.)

Soloway'092 discloses each of the plurality of components determining which of a plurality of paths leading to a destination component over which to send a particular packet, the path determined by referencing the one or more status data structures (see FIG. 3, forwarding table, and FIG. 4, Forwarding Process logic 40, Forwarding Table 36, Routing Logic 38, LSP Database; col. 3, line 15-5; note that the each switch re-computes/determines each route to the destination switch/end-node according to shortest path routing algorithm. Then after, the packets are routed according to the switchover/reconfigured/updated paths/links toward the destination).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Sheu'227 as taught by Soloway'092 by providing a mechanism to recomputed/re-calculate/determines the shortest path/routes toward the destination in the forwarding table for the same reason stated in Claim 6 above.

Regarding claim 9, the combined system of Sheu'227 and Soloway'092 teaches a router/bridge/switch, which consists of plurality of the plurality of input and output component, interconnected via switch fabric buses, and the router/bridge/switch utilizes the packet switching/routing techniques use in the packet switching network as described above in Claim 6.

Soloway'092 discloses wherein the one or more data structures include an output availability table to indicate whether a possible path through the packet switching system from the input component to a particular destination is available (see FIG. 2, forwarding table with hold down bit for channel 8a at switch 4d see col. 8, lines 12-61; note that when LSP

packet indicates that channel 8a is the affected channel/link, the forwarding table is updated with hold-down bit as an entry for that particular channel/link. Thus, the channels/links toward the destinations, which are not indicated by the hold-down bit, are the available/candidate paths/links.)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Sheu'227 as taught by Soloway'092 by providing a mechanism to indicate the affected channel/link toward the destination in order to determine/identify the available/candidate links for the same reason stated in Claim 6 above.

Regarding Claim 10, Sheu'227 discloses disabling at least one of the plurality of input components from sending packets to a particular destination of the packet switching system when a number of possible paths in the packet switching system leading to a particular destination falls below a predetermined threshold value (see FIG. 4, ACK messages, failure detection messages and failure declaring messages; see col. 6, line 14 to col. 7, lines 25; note that when ACK messages are send and received within predetermined time interval between the PEs, and the PE updates RCT according to the acknowledgements. When there is a failure, no acknowledgement is received within the predetermined threshold interval from the intended PE unit through the buses, and thus the number of possible paths toward the destination is reduced (i.e. when a paths in the packet switching system leading to a particular destination falls below a predetermined threshold value). Then, the detected PE unit sends a failure declaration message to send to the PEs, updates the routing/switching

information in the table, and switches over to operational PE by disabling the failed PE/link/path.)

Sheu'227 does not explicitly disclose disabling at least one of the plurality components (see FIG. 1, Switches 4a-4d) from sending packets to a particular destination through the packet switching system leading to a particular destination as identified by one or more received packets containing indications of one or more errors (see Soloway'092 FIG. 2, forwarding table with hold down bit for channel 8a at switch 4d; col. 8, lines 12-61; col. 3, line 1-23; note that LSP packet is send to each switch in the network in order to broadcast and notify the link state. Upon receiving LSP packet, each switch updates the forwarding table accordingly. In particular, when the LSP packet indicates that channel 8a is the affected channel/link, the forwarding table is updated with hold-down bit as an entry for that particular channel/link. Thus, the channels/links toward the destinations, which are indicated by the hold-down bit, are the disable switches/links/paths).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Sheu'227 as taught by Soloway'092 by providing a mechanism to indicate the affected/disable channel/link toward the destination for the same reason stated in Claim 6 above.

3. Amended Claim 5, new claims 19,20,23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sheu'227 in view of Turner (U.S. 4,734,907).

Regarding amended claim 5, Sheu'227 discloses wherein the packet switch includes a broadcast component, and the method comprises: sending a particular packet to the

broadcast component in response to said recognizing the error; and wherein said notifying the plurality of input components of the error includes sending one or more packets indicating the error from the broadcast component through at least a portion of said one or more interconnection networks to the plurality of input components as described above in Claim 1.

Sheu'227 does not explicitly disclose wherein the packet switch (see Turner'907 FIG. 13A, routing through a Switch module 200; see abstract, note that plurality of switching modules may be interconnected to form a packet switch) includes a second broadcast component (see Turner'907 FIG. 13A, node 364), and the method comprises: sending a second particular packet (see Turner'907 FIG. 13A, packet 82) to the second broadcast component; and wherein said notifying the plurality of components (see Turner'907 FIG. 13A, nodes 366 and 368) includes sending one or more packets from the second broadcast component through at least a third portion of said one or more interconnection networks (see Turner'907 FIG. 13A, a portion of the network between node 364 and nodes 366/368) to the plurality of components (see Turner'907 col. 14, line 21-55; note that one of the broadcast packet is received at node 364 from the 2nd portion of the network (i.e. a portion of the network between node 362 and 364). Then, node 164 broadcasts the received packet to node 366 and 368 via 3rd portion of the network.).

However, this limitation is taught by Turner'907. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Sheu'227, as taught by Turner'907 for the purpose of broadcasting a packet over the stages of network within a switch since Turner'907 states at col. 1, lines that it will provide a high

performance packet switch which is capable of efficient operation in broadcast mode. The motivation being that by broadcasting the packet via the stages within the switch, it can reduce the processing time/cost of a single node/component broadcasting to every node/component since the processing/load will be distribute to the secondary node/component will broadcast the rest of the network; thus increasing the performance of the packet switch.

Regarding new claims 19 and 23, Sheu'227 discloses wherein the broadcast component is located in one of said one or more interconnection networks as described above in Claim 1 and 21.

Sheu'227 does not explicitly disclose wherein the broadcast component is located in switching elements (see Turner'907 FIG. 13A, each switching node 362, 364, and 368 have the broadcasting capability; Turner'907 col. 14, line 21-55).

However, this limitation is taught by Turner'907. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Sheu'227, as taught by Turner'907 for the purpose of providing the switching nodes with the capability of broadcasting a packet over the stages of network within a switch for the same reason stated in Claim 5 above.

Regarding new claims 20 and 24, Sheu'227 discloses said one or more interconnection networks and the broadcast component is in one of said one or more interconnection networks as described above in Claim 1 and 21.

Sheu'227 does not explicitly disclose wherein each of said one or more interconnection networks includes three switching stages (see Turner'907 FIG. 13 A, three switching stages, 1st stage- between node 360 and 362, 2nd stage-between node 362 and 364, and 3rd stage-between node 364 and 386) and the broadcast component is located in a switching element of a second stage (see Turner'907 FIG. 13A, 2nd stage-between node 362 and 364) of said three switching stages in one of said one or more interconnection networks (see Turner'907 FIG. 13A, node 364 has a broadcasting capability since it broadcast to nodes 366 and 368; Turner'907 col. 14, line 21-55.)

However, this limitation is taught by Turner'907. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Sheu'227, as taught by Turner'907 for the purpose of providing 3 stage switching which includes the switching nodes with the second stage node capability of broadcasting a packet over the stages of network within a switch for the same reason stated in Claim 5 above.

1. Claim 13,14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Teraslinna '990 in view of Iino '115.

Regarding Claim 13, Teraslinna '990 discloses a packet switching system (Lines in 100-1 to 159-1, Fig. 1) comprising: a plurality of input components (Lines in 100-1 to 159-1, which couple to line circuits 200-1 to 269-1, Fig. 1; self-routing networks are packet switching networks that use information carried by the packets themselves to route the packets therethrough; see col. 6, line 16+); a plurality of output components (Lines out 100-2 to 159-2, which couple to line circuits 200-2 to 269-2; Fig. 2); and a plurality of interconnection networks (Nodes 340 to 389 in stages 1-3, Fig. 1 and Fig. 2), each of the

plurality of interconnection networks coupled to each of the plurality of input components and to each of the plurality of the output components to provide a plurality of paths between each of the plurality of input components and the plurality of output components; at least one of the plurality of input components includes an indication of which interconnection networks the at least one input component may send packets through to reach a particular output component (noted that he switching system comprises a switching network 300 having a plurality of switching nodes 340 to 389 arranged into a matrix, and a plurality of line (or trunk) circuits 200 to 269 which interface switching network 300 to telecommunication lines 100 to 159. Lines 100 to 159 are bidirectional, and so are line circuits 200 to 269. Nodes 340 to 389 are arranged into a regular matrix of rows 1 to (N+1) and columns, or stages, 1 to 3. Each node 340 to 389 is a symmetrical switching node having (N+1) inputs and (N+1) outputs-- (N+1) equal to 32 being common in the industry. Nodes 340 to 389 are conventional self-routing network nodes. Each receives at its inputs packets that carry their own destination address information. A node examines the address information of each received packet and, based on that information, routes the packet to one of its outputs; see Teraslinna '990, col.5, Line 5+).

Teraslinna '990 does not explicitly discloses each of the plurality of input components maintaining **a fault data structure** (malfunction flag, see Iino '115, Fig. 12A); wherein **the fault data structure** of at least one of the plurality of input components includes an indication of which interconnection networks the at least one input component may send packets through to reach a particular output component (when a malfunction occurs in the switch network 1, the control unit 2 sets a final stage malfunction flag and produces input

and output unit changing information. The final stage malfunction flag is set for selecting one of the ways to bypass the malfunctioning switch by either changing the input address or output address; see Iino '115, col. 5, line 60+; moreover, the routing information changing unit 21 changes the contents of a frame format (header) of the communication information when a malfunction occurs in the switch network 1, based on the input and output unit changing information sent from the control unit 2, see Iino '115, col. 9, line 27+).

This limitation is taught by Iino '115. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Teraslinna '990 with Iino '115 for the purpose of providing an exchange in which, when a malfunction occurs in one of a plurality of switches, a transmission path bypassing the malfunctioning switch can be formed in the absence of a spare switch and decrease weight and size of the entire system; see Iino '115, col. 2, line 36+. The motivation being that by notifying the remotes nodes regarding the malfunction and updating the routing table, it can bypass the fail node and decrease the weight/cost of route processing in the network.

Regarding Claim 14, Teraslinna '990 discloses a broadcast mechanism to notify the plurality of input components of the problem, (noted that the response of the system of FIG. 1 to a failure of a line circuit is shown in FIG. 8. When failure of a line circuit is detected, the line circuits 200 to 269 are notified/broadcasted, at step 800; see col. 5, line 68+).

Teraslinna '990 does not explicitly disclose a broadcast mechanism (Input Switching Unit 3, see Iino '115 Fig. 10) to receive an indication of a problem (Flag changing unit 22, see Iino '115 Fig. 10) within the packet switching system.

This limitation is taught by Iino '115. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Teraslinna '990 as taught by Iino '115 by providing a mechanism of receiving a message/packet with an indication of a problem due the publicized/broadcast/notification mechanism for the same reason stated in Claim 13 above.

Regarding Claim 15, Teraslinna '990 discloses a broadcast mechanism to notify the plurality of input components of the problem is located is located in one of the plurality of interconnection networks (see FIG. 1, a plurality Interconnected networks) as described above in Claim 13 and 14.

Teraslinna'990 does not explicitly discloses the broadcast mechanism to receive an indication of a problem (Input Switching Unit 3, see Iino '115 Fig. 10) is located in one of the plurality of interconnection networks (noted that FIG. 1 comprises a working switch network 101, a spare switch network 102 having the same structure as the working switch network 101, an input switching unit 103 and an output switching unit 10; see Iino '115 col. 1, line 26+).

This limitation is taught by Iino '115. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Teraslinna '990 as taught by Iino '115 by providing a mechanism of receiving a

message/packet with an indication of a problem due the publicized/broadcast/notification mechanism for the same reason stated in Claim 13 above.

2. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Teraslinna '990 and Iino '115 as applied to claim 13 above, and further in view of in view of Azuma '150.

Regarding Claim 16, both Teraslinna '990 and Iino '115 do not explicitly disclose that the broadcast mechanism is located in **each** of the plurality of interconnection networks (noted that in the example of FIG. 2A, a failure has occurred on the link between node A and node C. Node A and node C at the respective ends of the failed link detect the failure and enter a failure processing mode. Nodes A and C broadcast an alarm message for notifying the other nodes that a failure has occurred. The process executed so far concerns the broadcast phase, see Azuma '150, col. 5, and line 10+. Nodes A and C enter the computation phase after broadcasting the alarm message. Node B receives the alarm message broadcast from node A and node C. After recording the content of the message, node B broadcasts the alarm message; see Azuma '150 col. 5, line 17+).

This limitation is taught by Azuma '150. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Teraslinna '990 and Iino '115, with Azuma '150 for the purpose of providing a telecommunication node, a restoration method and a telecommunication network, wherein the aforementioned problems are eliminated; see Azuma '150, col. 1, line 62+. The motivation being that by providing information relating to a failure, it can determine alternate paths.

3. Claim 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Teraslinna '990 in view of Iino '115.

Regarding Claim 17, Teraslinna '990 does not explicitly discloses each of the input components references its associated fault data structure in determining which of the plurality of interconnection network through which to send a particular packet (noted that output table (1) information is referred to when the malfunctioning switch is included in the malfunction stage (c) (the final stage) of the switch network 1 so as to change a transmission path to bypass the malfunctioning switch. That is, the output table (1) storing unit 10 stores the output table (1) information which indicates each switch in the switch network 1 in relation to transmission paths each of which bypasses each switch in the switch network 1; see Iino '115, col. 6, line 45+).

This limitation is taught by Iino '115. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Teraslinna '990 as taught by Iino '115 for the same reason stated in Claim 13 above.

Regarding Claim 18, Teraslinna '990 does not explicitly discloses the fault data structure includes an output availability indication (output table 10, see Iino '115 Fig. 5; and note that the selecting unit 11 serves as a path selecting means for selecting a transmission path which bypasses a malfunctioning switch. That is, when a malfunction occurs in one of the switches in the switch network 1, the selecting unit 11 selects a transmission path which bypasses the malfunctioning switch based on the input table (1) information, the output table

(1) information, the input table (2) information and the output table (2) information; see Iino '115, col. 6, line 66+) of which of the plurality of interconnection networks through which its associated input component may send packets (note that a storing unit which stores table information indicating a plurality of routes each of which bypasses one of the switches in the switch network, each of the routes being indicated in relation to one of the inputs and outputs of the switch network; see Iino '115, col. 3, line 30+).

This limitation is taught by Iino '115. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Teraslinna '990 as taught by Iino '115 for the same reason stated in Claim 13 above.

Notes/Remarks

4. Examiner acknowledges that the typographical error was made as "Lino" instead of "Iino" when referring to the reference.
5. Objection to the speciation is withdrawn since the amendment was performed accordingly.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian N Moore whose telephone number is 703-605-1531. The examiner can normally be reached on M-F: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on 703-308-7828. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

INM
2/9/04

KENNETH VANDERPUYE
PRIMARY EXAMINER